

Greenhouse Gases and Agriculture.

Despite what President Trump thinks the undeniable fact is that Earth is warming up, with the average global temperatures having increased by 0.85 degrees C between 1880 and 2012. Scientific opinion is satisfied, with the exception of a very small percentage of deniers, that man-made greenhouse gases (GHGs) are the primary cause of global warming.

The main man-made GHG is carbon dioxide (CO₂) which accounts for 76% of global emissions. Methane (CH₄), another GHG, has 25 times the warming potential of CO₂, and nitrous oxide (N₂O) has 298 times higher warming potential of CO₂. These gases also remain in the atmosphere for different lengths of time. CO₂ does not break down easily and it remains in the atmosphere for hundreds of years. N₂O has a lifetime of 121 years and CH₄ has a lifetime of 12 years. GHGs from agriculture are mostly made up of CH₄ and N₂O from fertiliser, animal manures and rumination. It is because agriculture emits these more warming GHGs that it is having a more significant impact on global warming than other enterprises. Irish agriculture accounts for one-third of national GHG emissions which is unusual internationally and indicates the importance of agriculture economically in Ireland relative to other industries.

The Paris Agreement, which is much in the news recently, seeks to limit global temperature rise this century to below 2 degrees C above pre-industrial levels. The EU has also set emissions reduction targets with Ireland being allocated a 20% reduction in emissions by 2020 and 30% by 2030. This has implications for the future of Irish agriculture due to its proportional emissions.

The strategy that is being pursued to reduce GHG emissions from Irish agriculture is one of achieving better efficiencies. For example the less fertilizer that is used for a national kg of beef produced the less GHGs will be emitted nationally. Increased efficiencies also have the benefit of being more profitable to the farmer as well. However there is a problem which will not be easily resolved – if agricultural output increases will the increased GHG emissions be offset by the more efficient production?

The efficiency measures being employed include genetic improvements in dairy and suckler cows through the Economic Breeding Index and the Beef Data and Genomics programme (BDGP) respectively. The BDGP has created awareness among farmers of farm emissions and their possible improvement through the Carbon Navigator – which looks at emissions on the farm and their possible reduction. Improved fertilizer and slurry management will help increase nitrogen efficiency and reduce GHG emissions. There may also be opportunities for farmers to partake in offsetting emissions by capturing or sequestering carbon through afforestation. Teagasc research is ongoing on developing and quantifying new methods of reducing GHG emissions from agriculture and no doubt these new methodologies will be coming on-stream over the next few years.

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